W3351, W3316 & W3606 Removal Plan

Provided By: Hooper Corporation

March 12, 2021

Abstract

Removal of lines W3351, W3316 and W3606 is scheduled to be completed by 2030. Both W3351 and W3316 have long segments that are inaccessible with traditional line equipment as well as potentially significant environmental impacts. W3606 includes a difficult access segment located within Copper Falls State Park. To reduce environmental impacts, helicopter removal in conjunction with conventional ground removal of the structures is being evaluated. This plan lays out the process of removing the lines with helicopters and limited need for access to structures for conventual removal.

Figure 1: Project Location W3351 and W3316

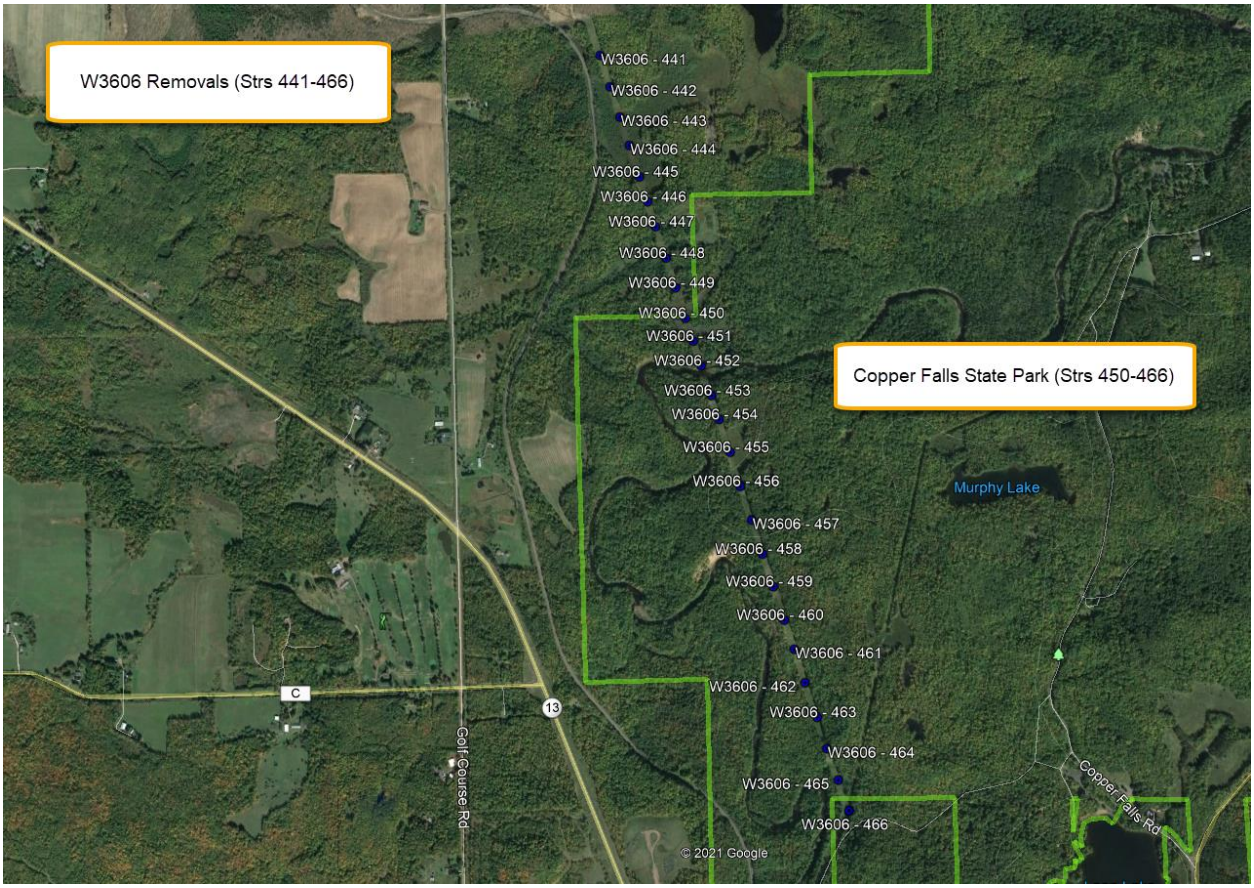

Figure 2: W3606 Helicopter Removal Location

Helicopters Used

This process will utilize two helicopters; one Sikorsky S61N “Medium Lift” for transporting tooling and materials and one light utility helicopter for transporting the crewmembers.

Figure 3: Medium Lift Helicopter (courtesy of CHI Aviation)

Figure 4: Light Utility Helicopter (courtesy of CHI Aviation)

Landing Zones

The helicopter will require a level and unobstructed surface approximately 200 feet square. In addition landing zones should be adjacent to a laydown area large enough to set down and disassemble all of the structures removed from that site. Landing zones and concurrent laydown yards should be spaced so as to limit weighted helicopter flights to no more than 5 miles. Increasing the distances limits the weights the helicopter can safely carry and increases the amount of time lost to re-fueling. Appendix A: Potential Fly yard locations includes aerial photos and descriptions of work completed from each laydown yard.

Crew Compliments

Each helicopter will be accompanied by a pilot, groundman and a full time mechanic. Each helicopter will have a fuel truck as well as 2 pickup trucks for support.

During helicopter work Hooper will provide four to five structure removal crews as well as a yard support crew. Total Hooper crew will be approximately 20 crewmembers. A list of Hooper equipment onsite can be found below.

(6) Pickup Trucks
(2) Digger Derricks
(2) Bucket Trucks
(1) Semi Tractor with Flatbed Trailer
(1) Dump Truck
(3) Argo ATVs with trailers
(1) Skid Steer
(1) RT Forklift
(1) Office Trailer
(2) Utility Trailers
(1) Tow Behind Pole Trailer
(2) Tow Behind Flatbed Trailers
(1) V-Groove Wind Up Puller

Removal Process

Prep Work

To prepare for the helicopter or conventional removals guard structures will need to be installed at road crossings and line crossings. This will allow for conductor to be secured and avoid impacts to the public during removal. In addition, fly yards will need to be prepped, landing zones matted and equipment put in place.

Structure Removal - Helicopter

On W3351 and W3606 a three man crew will be flown in by the small helicopter to the structure locations. Two crewmembers can be carried on the long line at a time. Tooling crates will need to be flown in once the crew is onsite. Once at the location, the crew will climb the poles to install the helicopter rigging and lower the existing conductor to the ground. After returning to the ground poles can be pre-cut at the ground line for removal. When the large helicopter arrives it can hook onto the rigging and the poles can be final cut and flown out. The helicopter will lay the full structure down in the laydown yard for further disassembly. The small helicopter will then be able to transfer the crew and tooling to the next structure location. We believe each crew will be able to remove one structure per hour and the two helicopters will be able to support 4 crews.

W3316 has the added challenge of two shield wires that will also need to be removed. For this reason structure removal crews on W3316 will include 4 members. They will need to pull the shield wires around the arm to lower them and will need to cut the X-Bracing in order to lower the conductor to the ground. For this reason we are anticipating one structure removed per crew every 1.25 hours.

Structure Removal – Conventional

In locations where conventional (land access) removal occurs, crews will install polymer mats along access route and at the structure location for construction vehicle access. Crews will use bucket trucks and cranes to disconnect and lower conductor to the ground and wind up conductor as outlined in "conductor removal " below. Bucket trucks and cranes will be used to dismantle existing wood poles and cut wood structures at grade. Disassembled structures will be hauled from the right of way on flat bed trucks and polymer mats removed and disturbed areas restored.

Conductor Removal

Once the structure removal has been completed, conductors have been lowered to the ground and are ready to be wound up. Roadways and crossings will be cleared up immediately after structure removals and winding up of the conductor can begin. The V-Groove puller can pull the conductors along the ground and wind them up into "donuts" that can then be banded and hauled away on a flatbed trailer. Wind up locations will typically be at road crossings and will require 10 – 15 mats on each side of the road to work off of.

Example Photos

Figure 5: Flying Tooling on W3351 (2018 Phase Raiser Project)

Figure 6: Long Lining Crewmembers from the Light Helicopter

Figure 7: Flying structures with a Heavy Lift Helicopter

Figure 8: Fly Yard Used on W3351 (2018 Phase Raiser Project)